publisher. The Zeitschrift will appear in semi-annual parts, at twelve marks a year. The scope of the journal furnishes such a good analysis of linguistic study that a translation is given :

I. NATURAL HISTORY OF LANGUAGE (Anthropology of speech).
   1. *Acoustic phenomena of expression* (phonetics). Physical phenomena, anatomy, physiology, pathology of the vocal organs and of the ear, difficulties of articulation, deafness, physiological explanation of articulate sounds.
   2. *Optical expression* (graphics), physical and anatomical. Physiology of mimicry, gesture speech. Pathology of writing.
   3. *Present relation of acoustic and optic expression.*

II. PSYCHOLOGICAL SIDE. Relations to psychology. Law of development (inheritance and variation).
   1. *Articulation.* Symbols and shifting of articulation.
   2. *Sound.* Psychology and shifting of sound.
   3. *Roots.* Definition of roots.
   4. *Words.* Sematology and change of meaning.
   5. *Sentence.* Comparative syntax, including sign language.

III. HISTORICAL SIDE.
   1. *Phylogenetic development.* Origin and prehistoric evolution, historic evolution, relation to ethnology, families of speech, &c.
   2. *Ontogenetic development.* Child-speech, acquiring foreign languages, &c.

MICROSCOPY.[1]

METHOD OF PUTTING PELAGIC ANIMALS TO SLEEP IN ORDER TO OBTAIN THEIR PHOTOGRAPHS.—Dr. Fol,[2] of Geneva, has made the important discovery that Cœlenterates and Echinoderms may be rendered insensible and kept so for hours and even days, without injury, by saturating the water with carbonic acid. The containing vessel must, of course, be hermetically closed. The animal at once becomes insensible and motionless, but preserves its natural appearance, and recovers at once when again placed in pure sea-water. This method may be used not only for obtaining life-like photographs, but also, as Dr. Fol suggests, for transporting animals alive. Fishes and mollusks do not survive this treatment, and crustaceans for only a short time.

Dr. Fol tried various narcotics, but found that small doses would not bring the animals to rest, while large doses acted as poisons. The same proved true of tobacco smoke and aqueous solutions of ether, chloroform and ethyl bromide. Sulphydric acid and carbonic oxide gave satisfactory results in only a few cases.

HERTWIG'S METHOD OF PREPARING AND CUTTING AMPHIBIAN EGGS.[3]—Although the amphibian egg has long been a favorite object of study among embryologists—and quite as much so

[1] Edited by Dr. C. O. WHITMAN, Newton Highlands, Mass.

[2] *Zoologischer Anzeiger*, No. 128, p. 698, 1882.

[3] Jenaische Zeitschrift für Naturwissenschaft, XVI, p. 249, 1882.

since section-cutting came into vogue as before—comparatively little progress has been made in overcoming the difficulties that attend its preparation for the microtome. The chief difficulties are found in freeing the egg from its gelatinous envelope, and in preparing it so as to avoid brittleness.

The best method that has thus far been proposed for these eggs is unquestionably that of O. Hertwig, and I shall therefore give it in detail.

1. In order to facilitate the removal of the gelatinous envelope, the eggs are placed in water heated almost to boiling (90–96° C.) for 5–10 minutes. The eggs are thus coagulated and somewhat hardened, while the envelope separates a little from the surface of the egg and becomes more brittle. The envelope is then cut under water with sharp scissors, and the egg shaken out through the rupture. With a little experience a single cut suffices to free the egg.

2. By the aid of a glass tube the egg is taken up and transferred to chromic acid (one-half per cent), or to alcohol of seventy, eighty, and ninety per cent. Chromic acid renders the egg brittle, and the more so the longer it acts; therefore the eggs should not be allowed to remain in it more than twelve hours. While eggs hardened in chromic acid never change their form or become soft when transferred to water, those hardened in alcohol, when placed in water or very dilute alcohol, lose their hardness, swell up and often suffer changes in form.

3. Alcoholic preparations are easily stained; but chromic acid preparations are stained with such difficulty and so imperfectly that Hertwig omitted it altogether.

There is an important difference between alcohol and chromic acid in their effect on the pigment of the egg. Chromic acid destroys the pigment to some extent, and thus obliterates, or at least diminishes, the contrast between pigmented and non-pigmented cell-layers. As the distribution of the pigment is of considerable importance in the study of the germ-lamellæ, it is well to supplement preparations in chromic acid with those in alcohol, in which the pigment remains undisturbed.

4. Eggs hardened in chromic acid were imbedded almost exclusively in the egg-mass recommended by Calberla. The great advantage offered by this mass is, that it supplies a sort of antidote to the brittleness of the egg. It glues the cell-layers together, so that the thinnest sections can be obtained without danger of breaking.

5. As the dorsal and ventral surfaces, and the fore and hind ends can be recognized in very early stages, it is important to know precisely how the egg lies in the egg-mass in order to deter-

mine the plane of section. In order to fix the egg in any given position in the imbedding mass, Hertwig proceeds as follows:

a. A small block of the hardened mass is washed in water to remove the alcohol, and in the upper surface of the block, which has been freed from water by the aid of filtering paper, a small hollow is made. This hollow is then wet with the freshly prepared *fluid* mass.

b. The egg is washed in water to remove the alcohol, placed on a piece of filtering paper to get rid of the water, turned on the paper by a fine hair brush until it has the position desired; the point of the brush is next moistened and pressed gently on the upper surface of the egg, the egg adheres to the brush and may thus be transported to the hollow prepared for it in the block.

c. After the egg has thus been placed in position, a drop of absolute alcohol carefully applied will coagulate the "fluid mass" with which the hollow was wet, and thus fix the egg to the block. The block is again washed, and finally imbedded in the egg-mass, which is prepared in the following manner:

Calberla's Method of Imbedding.[1]—The white of several eggs is separated from the yelk, freed from the chalazæ, cut with shears, and thoroughly mixed by shaking with a ten per cent solution of carbonate of sodium (fifteen parts of the white to one part of the solution). The yelk is next added and the mixture shaken vigorously. After removing the foam and floating pieces of yelk by the aid of filtering paper, the so-called "egg-mass" is ready for use. It is this fluid with which the hollow in the solid block is wet, as before mentioned, the block itself being only a piece of the same mixture after it has been hardened in alcohol.

Calberla soaks the eggs a few minutes (5-20) in the fresh white of the egg before imbedding; Hertwig appears to omit this part of the process.

After the egg has been fixed to the block as before indicated (*c*), it is placed in a paper box and covered with the fresh mass (1-2^{cm} deep). The box is then placed in a vessel that contains alcohol (75-80 per cent), enough to bathe its lower half; the vessel, covered with a funnel, is heated over a water bath for 30-40 minutes, care being taken not to *boil* the alcohol. The imbedding substance, thus hardened, is next placed in cold alcohol (ninety per cent), which should be changed once or twice during the first twenty-four hours. After remaining in alcohol for about forty-eight hours the imbedded egg is ready for cutting.

[1] Morphologisches Jahrbuch, II, p. 445, 1876